Apple Qmaster 4

User Manual

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Welcome to Apple Qmaster

The Apple Qmaster system provides automated work distribution and processing for high-volume projects created with digital visual effects software packages such as Shake.

This preface covers the following:

- About Apple Qmaster (p. 5)
- About the Apple Qmaster Documentation (p. 5)
- Additional Resources (p. 6)

About Apple Qmaster

The Apple Qmaster application described in this document is the graphical "client interface" that you use to submit jobs for distributed rendering and processing. Apple Qmaster can accept jobs from Shake, Autodesk Maya, and any UNIX command-line program. The Apple Qmaster application is one of several applications in the Apple Qmaster distributed processing system. The complete system includes controls for configuring clusters of processing computers and for monitoring, pausing, resuming, or canceling work that has been submitted.

Important: Apple Qmaster 4 is designed to work closely with Final Cut Pro X and later and Motion 5 and later. All mentions of Final Cut Pro and Motion in this document refer to these versions.

About the Apple Qmaster Documentation

Apple Qmaster comes with various documents that will help you get started as well as provide detailed information about the application. To access these documents, open Apple Qmaster and choose Help > Apple Qmaster Help.

- *Apple Qmaster User Manual:* This document describes the Apple Qmaster client application only. For information about how to create a complete network for Apple Qmaster processing, as well as information about how the Apple Qmaster application works with the rest of the Apple Qmaster system, see the *Compressor 4 User Manual*.

- *Compressor User Manual:* In addition to explaining how to use Compressor, this document explains how to set up and maintain an Apple Qmaster distributed processing network for use with Compressor or digital visual effects software packages such as Shake.
- *Apple Qadministrator User Manual:* This document describes the Apple Qadministrator cluster management application only. You use this application to manually configure clusters using managed services.
- *Share Monitor User Manual:* This brief document describes how to use Share Monitor to monitor the transcoding progress of batches and jobs.

Additional Resources

Along with the documentation that comes with Apple Qmaster, there are a variety of other resources you can use to find out more about Apple Qmaster.

Compressor Websites

For general information and updates, as well as the latest news on Compressor, go to:

- http://www.apple.com/finalcutpro/compressor

Apple Service and Support Websites

For software updates and answers to the most frequently asked questions for all Apple products, go to the general Apple Support webpage. You'll also have access to product specifications, reference documentation, and Apple and third-party product technical articles.

- http://www.apple.com/support

For software updates, documentation, discussion forums, and answers to the most frequently asked questions for Compressor, go to:

- http://www.apple.com/support/compressor

Using Apple Qmaster

1

The Apple Qmaster application is the client software you use to submit jobs and batches (for Shake and related software) to the larger Apple Qmaster system, an automated work distribution and processing solution for high-volume projects.

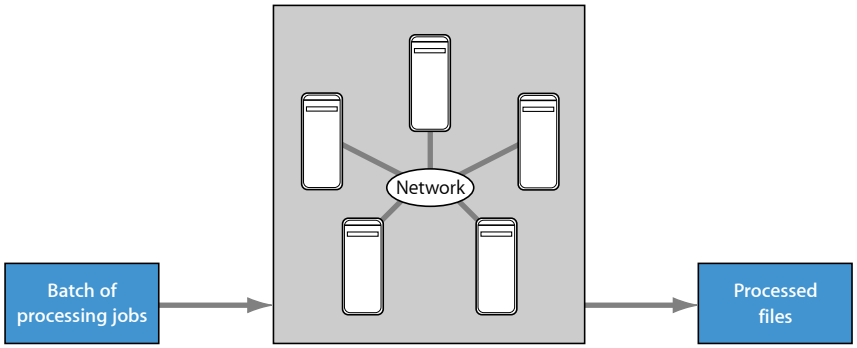
Note: The "Apple Qmaster and Distributed Processing" chapter in the *Compressor User Manual* is the primary documentation for the Apple Qmaster distributed processing system.

This chapter covers the following:

- The Apple Qmaster Distributed Processing System (p. 8)
- The Apple Qmaster Interface (p. 10)
- Installing Apple Qmaster, Shake, and Other Applications (p. 14)
- Setting Up Rendering Services and Shared Storage (p. 15)
- Submitting Batches for Apple Qmaster Processing (p. 16)
- Using Nodes Without Apple Qmaster Installed (p. 29)
- Setting Environment Variables in Apple Qmaster (p. 31)

The Apple Qmaster Distributed Processing System

Computers that submit batches to Apple Qmaster are called *clients*. An Apple Qmaster *job* is a processing task in the form of a project shared by Final Cut Pro or Motion, a Compressor or Apple Qmaster batch, a Shake file, or other commands, that uses UNIX commands to specify settings such as rendering instructions and file locations and destinations.



Although a batch can include just one job, you will typically want to submit several jobs at once for processing. Similarly, several people can use the same Apple Qmaster system at the same time, with several client computers sending batches in the same time frame. Batches are managed and distributed by the computer that is designated as the Apple Qmaster *cluster controller*.

Note: The "Apple Qmaster and Distributed Processing" chapter in the *Compressor User Manual* is the primary documentation for the Apple Qmaster distributed processing system.

Clients

Batches are submitted for processing from the client computers. A *client computer* can be any computer that has Compressor, Final Cut Pro, or Motion installed and is on the same network as the cluster controller. Multiple client computers can be on the same network, using the same cluster to do the processing for various applications. See Submitting Batches with the Apple Qmaster Application for details.

Clusters

When a client sends batches to the Apple Qmaster system, all the processing and subsequent moving of any output files is performed by a group of Apple Qmaster–configured computers called a *cluster*. To set up Apple Qmaster services, you either configure computers to work with This Computer Plus, create a QuickCluster in Compressor, or use the Apple Qadministrator application to create one or more clusters of service nodes, with one cluster controller included in each cluster. Each computer in the cluster is connected to the other computers in the cluster through a network connection. See the *Apple Qadministrator User Manual* for more information on specialized cluster setup.

Note: See the Shake Support website (http://www.apple.com/support/shake) for an online guide to setting up a full-time "render farm," incorporating an Xserve computer and cluster nodes.

Service Nodes

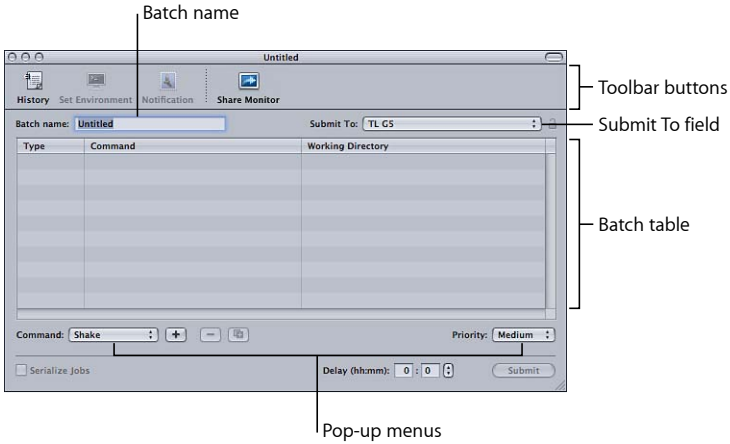
When you combine multiple nodes into a cluster, they function as one very powerful computer because all their resources are shared. You make a computer available as a service node by configuring it in the Compressor Apple Qmaster Sharing window. The steps involved in using this window to configure a service node are described in "Configuring Service Node Processing" in the *Compressor User Manual*, available in Compressor Help.

Cluster Controllers

The cluster controller software acts as the manager of a cluster. The cluster controller directs the distribution of batches within the cluster. It has the ability to determine the best use of the cluster resources based on work and availability variables. You make a computer available as a cluster controller by turning on the cluster controlling service in the Apple Qmaster Sharing window in Compressor. (See "Configuring Service Nodes and Cluster Controllers" in the *Compressor User Manual*, available in Compressor Help.)

The Apple Qmaster Interface

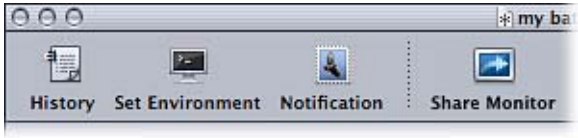
The Apple Qmaster application described in this document is one part of the larger distributed processing system described in The Apple Qmaster Distributed Processing System. The Apple Qmaster application is the client software you use to submit jobs and batches to the system. Both this application and the larger system are known by the same name (Apple Qmaster).



The Apple Qmaster window contains a toolbar; a Batch Name field; a Submit To field; the Batch table; buttons to add, remove, and submit jobs (dimmed until at least one job is in the Batch table); and pop-up menus to choose job types and batch priority.

Toolbar Buttons

The Apple Qmaster toolbar contains the following buttons.

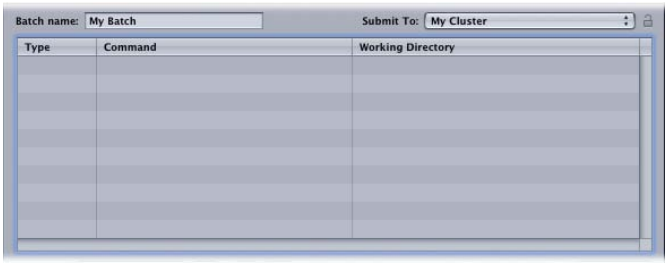


- *History:* Opens the History drawer, where you can view a full log of all batches submitted from your computer, check the current status of all processing batches, and resubmit any batches listed in the log.
- *Set Environment:* Opens a dialog where you can add environment variables and preflight scripts.

- *Notification:* Opens a dialog where you can set (or reset) an email address to which the status of a batch completion or failure can be sent. Apple Qmaster does not currently support SMTP servers that require authentication. The following list shows the processing service type followed by the notification label used in the emails and logs:
  - *Local Compressor service:* servicecontroller:com.apple.stomp.transcoder
  - *Distributed Compressor service:* servicecontroller:com.apple.stomp.transcoderx
  - *Distributed Apple Qmaster service:* servicecontroller:com.apple.qmaster.executor
- *Share Monitor:* Opens Share Monitor, which allows you to view the status of all batches being processed.

Batch Table

This is the large middle area of the Apple Qmaster window that lists the individual jobs in a batch.



The Batch table includes the following columns.

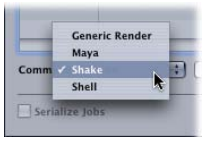
- *Type:* One of four job types: Shake, Maya, Generic Render, Shell (UNIX).
- *Command:* The actual command for the job.
- *Working Directory:* If relevant, the directory from which you want the command to be executed.

Text Fields and Pop-Up Menus

Around its periphery, the Apple Qmaster window includes other important interface elements for creating and submitting jobs and batches.

- *Batch name field:* This is where you can enter the name of a particular batch. (This is the name that appears in Share Monitor.)
- *Submit To pop-up menu:* Use this pop-up menu to choose an available cluster to process the current batch.

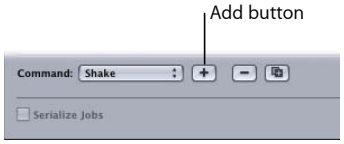
- *Command pop-up menu:* Use this pop-up menu to create commands.



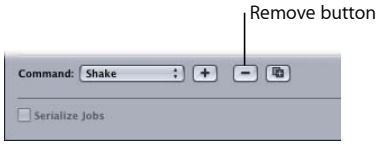
You can choose one of the following types of jobs.

- *Generic Render:* For more information, see Submitting Batches with the Generic Render Command.
- *Maya:* For more information, see Submitting Maya Batches.
- *Shake:* For more information, see Submitting Shake Batches.
- *Shell:* For more information, see Using Apple Qmaster to Submit UNIX Commands.

- *Add button:* Use the Add (+) button to enter a job (with the selected job type) in the Batch table.



- *Remove button:* Use the Remove (–) button to delete the selected job from the Batch table.

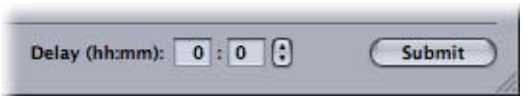


- *Duplicate button:* Use the Duplicate button to duplicate the selected job in the Batch table.

- *Serialize Jobs:* Select this checkbox to execute jobs in exactly the order in which they appear in the batch list. For example, if you have a Shake script that requires the output of a Maya script, you can ensure that the Shake script does not execute until the Maya script is completed.

- *Priority:* Use this pop-up menu to set the relative priority (urgency) for a batch. This pop-up menu allows you to set the priority level (High, Medium, or Low) of a batch, relative to other batches. It defaults to Medium. High-priority batches get processed before medium-priority and low-priority batches.

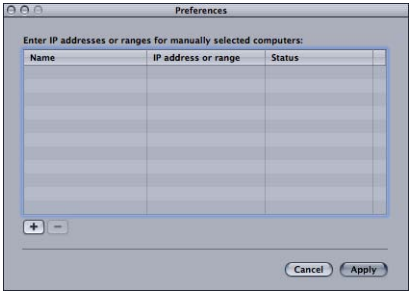
- *Delay:* Use these text fields to set a delay in hours or minutes for any job in the batch. Click in either text field (left field = hours, right field = minutes) to enter the corresponding value. Click the arrows to step through minutes in increments of 5 at a time, or, if the Hour text field is selected, in increments of 1 hour at a time.



- *Submit:* Click the Submit button to process the batch using the parameters set in the Apple Qmaster window.

Apple Qmaster Preferences

You can use the Apple Qmaster Preferences window to adjust how Apple Qmaster works with remote computers.



About the Apple Qmaster Preferences Window

The Apple Qmaster Preferences window includes the following items.

Remote Computer Settings

- *Enter IP addresses or ranges for manually selected computers table:* This table displays information about remote host computers.
- *Add and Remove buttons:* Use these buttons to add or remove information about remote host computers.

Remote Computer Address Dialog

This dialog is displayed when you click the Add or Remove button in the main Preferences window. Use this dialog to enter IP addresses or ranges for manually selected computers.

- *Host and Host IP Address Range buttons:* These buttons control whether this dialog is in IP Address mode (in which you enter a specific address) or IP Address Range mode (in which you enter a range of addresses).
  - *Host:* Use this mode to enter a host name and IP address for a specific remote computer.
  - *Host IP Address Range:* Use this mode to enter a name and set of range numbers (Range From, Range To) for a range of remote IP addresses.

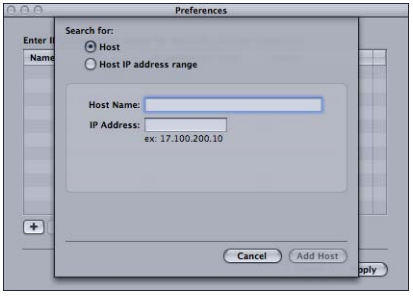
Setting Apple Qmaster Preferences

Follow the instructions below to set Apple Qmaster preferences.

To manually enter IP addresses or ranges for remote service host computers

1 Click Add (+).

The host address dialog appears.



2 In the host address dialog, do one of the following:

- Select Host, complete the Host Name and IP Address fields, and click Add Host.
- Select "Host IP address range," complete the Range fields, and click Add Range.

The hosts or host ranges appear in the Host table in the main Preferences window.

Important: Any changes you make to the Apple Qmaster preference settings take effect only when you click Apply. If you make changes but decide not to use them, click Cancel.

Installing Apple Qmaster, Shake, and Other Applications

Each rendering application has a slightly different installation procedure. See the "Apple Qmaster and Distributed Processing" chapter in the *Compressor User Manual*, available in Compressor Help, for information on installing the Apple Qmaster suite of applications.

To use Apple Qmaster with Shake, or other frame-based rendering applications, you must follow these installation and licensing guidelines.

- *To submit batches for Shake:* A copy of Shake must be installed on every node in the cluster. For command-line rendering on Mac OS X, a license is not needed.
- *To submit batches for Maya:* Install and license a copy of Maya on every node in the cluster.
- *To submit batches for other frame-based rendering applications:* Install a copy of the rendering application on every node in the cluster. For example, you must install a copy of After Effects 6.5 on every node in the cluster. It's important that you install aerender, the command-line renderer for After Effects. After Effects requires a product key and serial number before installation.

Note: In all three of the above cases, you will need to install any third-party plug-ins, fonts, and so on, that your projects require on each node in the cluster.

Setting Up Rendering Services and Shared Storage

Here are some additional tips on setting up an Apple Qmaster "render farm."

Changing the Number of Rendering Service Instances

By default, Apple Qmaster enables one rendering service per core. On a dual-core system, you will have two rendering services enabled by default. So that means out of the box, two copies of Shake will be running at the same time on a dual-core system. It may be necessary to disable a rendering service. For more information on changing the number of rendering services, see the "Apple Qmaster and Distributed Processing" chapter in the *Compressor User Manual*, available in Compressor Help.

Note: If you are using Shake, you can always change the number of processors Shake uses at submission time by using `-cpus x`, where `x` is the number of threads to use.

Shared Volumes

All the nodes in the cluster must have a common volume to work from; otherwise they will not know where to find assets needed for any given batch. There are many ways to set up file sharing. For more information, see the Mac OS X documentation on file sharing and the Mac OS X Server documentation.

Dedicated NFS Servers

You can set up a dedicated NFS server. For more information, see the Mac OS X Server documentation.

Shared Volume Media Management with Shake

It may be necessary to relink your assets once you move your project to the shared volume. This varies depending on the types of files, plug-ins, fonts, and environmental requirements. Things that commonly need to be changed are the FileIn and FileOut paths, and `env` variables such as `NR_INCLUDE_PATH` and `NR_FONT_PATH`. `UNC` should be disabled, as these paths are typically not resolvable to nodes in the cluster when arbitrary host names are used.

To disable UNC and enable Apple Qmaster from within the Shake application

1. Go to: `~/nreal/include/startup`
2. Create a file called: `qmaster.h`
3. Add the following:

```
script.uncFileNames = 0;
sys.useRenderQueue = "Qmaster";
```

4. Press Return several times after the last line.
5. Save your work.

Submitting Batches for Apple Qmaster Processing

Jobs are submitted in the form of a batch, and a batch can include one or more jobs. Batches can be submitted from any computer that:

- Has Compressor software installed
- Is on the same network as the cluster to which you are submitting the batch

Submitting Batches with the Apple Qmaster Application

Apple Qmaster includes a plug-in for Shake that automates and customizes the process by which Shake batches are submitted with Apple Qmaster. Because of this, the process for submitting Shake batches is more automated than is the process for submitting batches for other applications that do not have such plug-ins. A plug-in is included for Autodesk Maya, as well as a generic Render Command plug-in for other frame-based rendering applications, and a Shell Command plug-in that works with any application that can be executed from the UNIX command line.

The plug-ins automatically set some default parameters for the job. They also provide a dialog for you to adjust these parameters to your needs and to add more command-line options to each job.

- *To submit batches for Shake:* See Submitting Shake Batches.
- *To submit batches for Maya:* See Submitting Maya Batches.
- *To submit batches for other frame-based rendering applications:* See Submitting Batches with the Generic Render Command.

- *To submit batches for any application that can be executed from the UNIX command line:* See Using Apple Qmaster to Submit UNIX Commands.

Submitting Shake Batches

Using Apple Qmaster, you can quickly create and submit a batch of Shake jobs.

Note: You can also submit Shake batches as described in Using Apple Qmaster to Submit UNIX Commands, but the following method is the easiest way to submit Shake batches with Apple Qmaster.

To submit Shake batches with Apple Qmaster

1. Open Compressor and choose Apple Qmaster > Create Rendering Jobs.

   Apple Qmaster opens.

2. Enter a name for the batch in the "Batch name" field. (This is the name that appears in Share Monitor after you submit the batch.)

3. Do one of the following:

   - Drag the Shake (.shk) file to the Batch table (the middle area of the Apple Qmaster window).
   - Choose Shake from the pop-up menu, then click the Add (+) button to add a job.

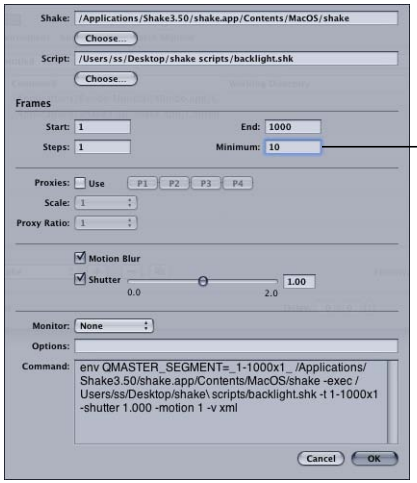
4. In the dialog that appears, do the following:

   a. In the Script field, enter the location of the Shake file if it isn't already shown. (If you dragged the file to the window, the file location is already there.)

      Note: The Shake field shows the default location of Shake on your computer. If it is not correct, be sure to update it.

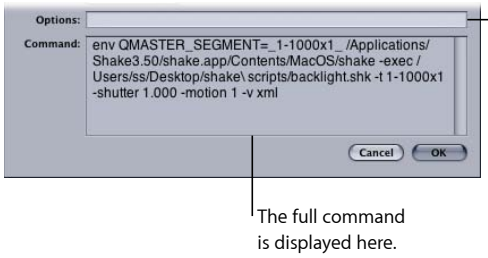
   b. If you wish, edit the available values and settings to customize the command. For more information, see About the Shake Plug-in Dialog.

Each setting corresponds to a commonly used Shake command, with the exception of the Minimum setting. See the Shake documentation for further information about the Shake settings in this dialog. See About the Shake Plug-in Dialog for more information about the the Minimum setting.



With the exception of the Minimum setting, each setting in the dialog corresponds to a commonly used Shake command or option. Refer to the Shake documentation for more information.

c If you wish, add other command-line options to the Options field.

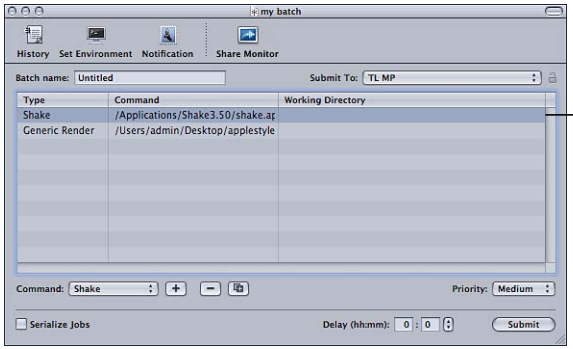


You can further customize the batch instructions by adding command-line options here.

The full command is displayed here.

d Click OK when you have finished with this dialog.

The Shake job appears in the window.



The job appears in the window.

5 To add more jobs to this batch, repeat steps 3 and 4.

6 As needed, make any final changes to the batch, such as either of the following:

- *To edit a command in the list:* Double-click the job. The command dialog in step 4 appears.
- *To delete a job from this batch (before you submit the batch):* Select the job you want to delete and click the Remove (–) button.

7 As needed, set the following options for this batch.

- *Submit To:* Choose a cluster to process this batch.
- *Working Directory:* If relevant, enter the working directory (from which you want the command to be executed).
- *Priority:* Choose the priority level from the pop-up menu. The higher the priority, the sooner and faster this batch will be processed relative to other batches.
- *Delay:* Specify how long you would like the system to wait before processing this batch.

8 Click Submit to send the batch out for processing.

Any output files for the batch are placed in the destination specified in the script file or command.

Note: If you are using Apple Qmaster to render Shake jobs as QuickTime movie output, every service node in the Apple Qmaster cluster must have Mac OS X v10.6 or later.

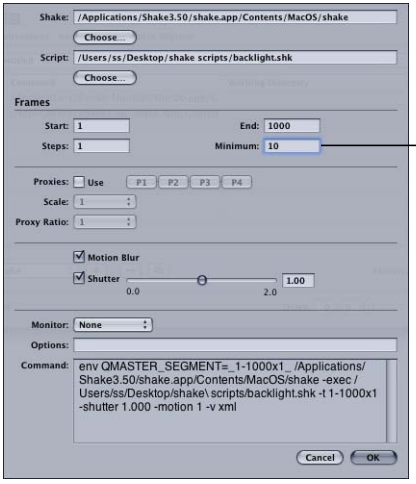
Saving Time with Apple Qmaster

The Apple Qmaster interface includes some additional features that you may find convenient.

- *Duplicating jobs:* To duplicate a job, select it and click the Duplicate button, which is next to the Remove (–) button. This is especially useful if you want to submit similar jobs. You can make copies of the same job and then edit values in Apple Qmaster as needed.
- *History:* By clicking the History button, you can view the dates and names of batches that have been sent previously from Apple Qmaster, and you can drag them to the batch list in the Apple Qmaster window to add a copy of them to a batch you are creating. To drag a job or batch from the History table in Apple Qmaster, select the first column of the job or batch, then drag. The History drawer also has a Progress column that indicates the current status of all processing batches. It is updated every 5 seconds.
- *Saving a batch:* To save a copy of a batch you have created with Apple Qmaster, in case you may need to resubmit it, choose File > Save As.

About the Shake Plug-in Dialog

The Shake Plug-in dialog contains the following settings.



With the exception of the Minimum setting, each setting in the dialog corresponds to a commonly used Shake command or option. Refer to the Shake documentation for more information.

Basic Shake Plug-in Dialog Details

- *Shake field:* The Shake field shows the location of the Shake application on your computer.
- *Script field:* The Script field shows the location of the Shake project file. (You can also drag the file to the Batch window to have the file location entered automatically.)

- *Ignore script failures checkbox:* This checkbox allows you to determine whether Apple Qmaster should continue rendering all the frames of the script in the event that Shake returns a non-zero UNIX command result. (In Apple Qmaster 2 and previous versions, a job would always fail if any segment returned non-zero.) By default, this checkbox is not selected. Select the checkbox if Apple Qmaster should ignore non-zero UNIX command results.
- *Start field:* Sets the start frame for the job. Refer to the Shake documentation for more information.
- *End field:* Sets the end frame for the job. Refer to the Shake documentation for more information.
- *Steps field:* Refer to the Shake documentation for more information.
- *Minimum field:* You can change the value in the Minimum field to change the minimum number of frames in each Apple Qmaster segment. For example, with a minimum value of 10 (the default), Apple Qmaster would divide a 100-frame job into at least 10 segments of 10 frames each. If you changed the minimum value to 5, Apple Qmaster would divide a 100-frame job into at least 20 segments of 5 frames each. (When you set a minimum, keep in mind that although smaller segments allow a job to be distributed to more nodes at once, smaller segments can also mean that more processing effort is spent on opening and closing Shake on each node.)

Proxies Details

- *Use checkbox:* This checkbox activates the Proxies feature. Refer to the Shake documentation for more information.
- *Proxy buttons:* Although the four default proxy settings are identical in both Shake and Apple Qmaster, they have slightly different names in each application. The list below indicates the corresponding names. The Apple Qmaster name is in italics, followed by the corresponding Shake name:
  - *P1:* Base
  - *P2:* P1
  - *P3:* P2
  - *P4:* P3

  Refer to the Shake documentation for more information.
- *Scale pop-up menu:* Refer to the Shake documentation for more information.
- *Proxy Ratio pop-up menu:* Refer to the Shake documentation for more information.

Motion Blur Details

- *Motion Blur pop-up menu:* The Motion Blur pop-up menu contains several options for configuring motion blur settings.
  - *Default for script:* Retains custom motion blur settings from the original Shake script.

- *Off:* Turns off motion blur.
- *On:* Turns on motion blur.

- *Shutter checkbox:* Refer to the Shake documentation for more information.
- *Shutter slider and field:* Refer to the Shake documentation for more information.

Additional Shake Plug-in Dialog Details

- *Monitor pop-up menu:* Though the Monitor pop-up menu corresponds to a Shake command option, it requires some explanation in the context of this dialog. The pop-up menu lets you choose whether or not to display each frame as it renders. If you don't want to see the frames as they render, choose None. To see the frames as they render, choose a display from the Monitor pop-up menu, then specify the FileOut node in the Options field. For example: -node *nodename*. (If the script has only one FileOut node, there is no need to specify it.)
- *Options field:* You can customize the batch instructions by adding command-line options here.
- *Command:* The full command is displayed here.

Submitting Maya Batches

There is a special dialog within Apple Qmaster for specifying commands for the distributed processing of Maya files. Apple Qmaster can utilize separate clusters for Shake and Maya, or draw from a single pool of processing resources for both applications.

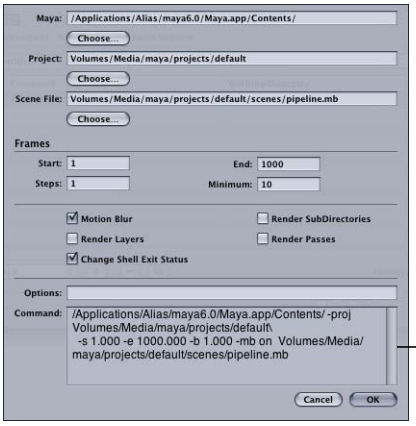
To submit a batch of Maya files for processing

1. Open Compressor and choose Apple Qmaster > Create Rendering Jobs.

   Apple Qmaster opens.

2. Choose Maya from the Command pop-up menu, then click the Add (+) button to add a job.

3 In the dialog that appears, enter the relevant information in the required and optional fields.



Some fields and settings in this dialog are optional, but the following are required:

- The Maya field displays the default location for the Maya application—make sure it is correct.
- Use the Choose buttons to navigate to and choose the location of the Maya project and scene files for this job.
- In the Frames section, enter a Start and End frame for the job.

The available settings correspond to commonly used Maya command options. You can also type additional command options in the Options field. See the Maya documentation for more information about all the Maya command settings.

4 Click OK when you have finished creating the full command.

5 To add more jobs to this batch, repeat steps 2 through 4.

6 As needed, set the following options for the batch in the Apple Qmaster window:

- *Submit To:* Choose a cluster to process this batch.
- *Working Directory:* If relevant, enter the working directory (from which you want the command to be executed) in the Working Directory column.
- *Priority:* Choose the priority level from the pop-up menu. The higher the priority, the sooner and faster this batch will be processed relative to other batches.

7 Click Submit to send the batch out for processing.

Important: By default, Apple Qmaster ignores Maya plug-in error messages. If you use Maya plug-ins, you can change this by removing or renaming `/Library/Application\ Support/Apple\ Qmaster/MayaCommandPlugin.commandPlugin/Contents/Resources/mayascript`. Advanced users can customize MayaScript to suit their environment and workflow.

Media Management in Maya Projects

Most Maya assets are contained in the project directory. If your project uses external files, you will need to relink them when the project is moved to the shared volume.

It may be necessary to retarget your assets once you move your project to the shared volume. This varies depending on the types of files and plug-ins used. If you are handing this project to a cluster administrator, you should save the file in Maya ASCII (.ma) as well. This way, it can be edited to fix path problems without advanced knowledge of using Maya.

Mental Ray for Maya Submissions and Other Options

To use the Mental Ray for Maya renderer, add `-r mr` to the Options field. You must have a licensed copy of Maya on each node in the cluster to use the Mental Ray renderer. Apple Qmaster does not use Maya Satellite, so in this regard, there is no difference in Maya Complete versus Maya Unlimited, except for the plug-ins that ship with Unlimited. If the node in question has only one processor, the number of satellite processors does not apply to Apple Qmaster.

Another option is `-rt`. This specifies the number of rendering threads. By default, the number of rendering threads is 2. You might want to change this value depending on the type of computers in your cluster. In a homogeneous cluster environment, say of Mac Pro or Power Mac G5 quad systems, you would change this value to 4, as there are four processors per node, and some Maya operations might be faster with more threads. This option is passed to all the nodes in the cluster. So, if you have nodes that vary in the number of processors, you will have to be careful with the number of threads you use. Too many threads can result in lower performance for those nodes.

If you want to selectively enable the number of threads a node uses, you must use a wrapper.

To force Apple Qmaster to heed Maya plug-in warnings

- Remove or rename the following file:

  `/Library/Application\ Support/Apple\ Qmaster/MayaCommandPlugin.commandPlugin/Contents/Resources/mayascript`

Submitting Batches with the Generic Render Command

You can use the Generic Render command in Apple Qmaster for the distributed processing of projects from other frame-based rendering applications (such as After Effects and LightWave). The plug-in dialog allows you to adjust parameters and to add more command-line options to each job.

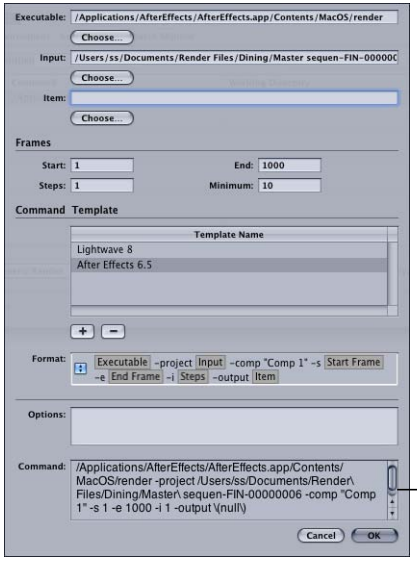
To submit a batch of files for processing using the Generic Render command

1. Open Compressor and choose Apple Qmaster > Create Rendering Jobs.

   Apple Qmaster opens.

2. Choose Generic Render from the Command pop-up menu, then click the Add (+) button to add a job.

3. In the dialog that appears, enter the relevant information in the required and optional fields.



Some fields and settings in this dialog are optional, but the following are required:

- The Executable field requires the location of the frame-based rendering application—make sure it is correct.
- Use the Choose buttons to navigate to and choose the location of the project and scene files for this job.
- In the Frames section, enter a Start and End frame for the job.

4. In the Command Template section, do one of the following:

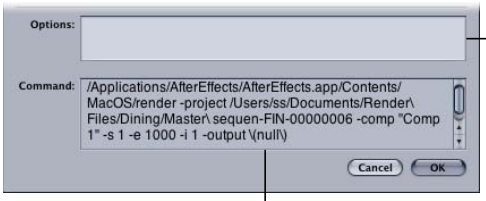
   - Use the Default Template as is, or adjust it by adding additional command elements from the pop-up menu.

- Click the Add (+) button to create an additional template, and adjust it by adding additional command elements from the pop-up menu.

  Note: You can change the order of the command elements by dragging them left or right.

5 If necessary, add command-line instructions in the Options field. Any text entered here will be appended at the end of the command.

6 Verify the full command in the Command text box and click OK.



You can further customize the batch instructions by adding command-line options here.

The full command is displayed here.

7 To add more jobs to this batch, repeat steps 2 through 6.

8 As needed, set the following options for the batch in the Apple Qmaster window:

- *Submit To:* Choose a cluster to process this batch.
- *Working Directory:* If relevant, enter the working directory (from which you want the command to be executed) in the Working Directory column.
- *Priority:* Choose the priority level from the pop-up menu. The higher the priority, the sooner and faster this batch will be processed relative to other batches.

9 Click Submit to send the batch out for processing.

Important: If you output from the Generic Render plug-in to single files containing all the frames, such as a QuickTime movie, all the nodes of a cluster may try to write to the same file at the same time. To avoid this problem, choose a different output file format or use a different render command.

Generic Render Command and Non-Zero Exit Status

The "Treat non-zero exit status as failure" checkbox in the Generic Render dialog allows you to use Apple Qmaster with rendering applications that return non-zero results that are not intended to indicate failure. By default, this checkbox is selected. If your rendering application issues non-zero results that are not intended to indicate failure, deselect the checkbox.

Submitting After Effects Batches with the Generic Render Command

The following template is a good starting point for using the Generic Render plug-in to render After Effects projects:

```
[EXECUTABLE] -project [INPUT] -comp "Comp 1" -RStemplate "Multi-Machine
Settings" -OMtemplate "Multi-Machine Sequence" -s [START FRAME] -e [END
FRAME]-output [ITEM]/test[####].psd
```

Where:

```
[EXECUTABLE] = /Applications/Adobe\ After\ Effects\ 6.5/aerender
```

```
[INPUT] = /SHARED_VOLUME/Projects/AEProjs/Wine_Country/QMproject.aep
```

```
[START FRAME] = 0
```

```
[END FRAME] = 544
```

```
[STEPS] = Not Used
```

```
[ITEM] = /SHARED_VOLUME/Projects/AEProjs/Wine_Country/output
```

In the example above, "`Comp 1`" is the name of the composition in your After Effects project and "`test[####].psd`" is the output filename. Since you cannot select an output filename in the template's Item field before the output has been rendered, first select the output directory, then add the filename to the Item field.

Note: In the example, `/SHARED_VOLUME/Projects/` is the shared volume. If you created the project on a computer that is not using the shared volume, copy the project to the shared volume, open After Effects, and relink any missing media.

Here are additional tips for using the Generic Render plug-in to render After Effects projects:

- After Effects makes good use of multiprocessor systems, but on projects that are not processor-bound, two rendering services per node give you better results.
- After Effects custom template information is stored in Users/*username*/Library/Preferences/Adobe After Effects 6.5 Prefs/. If you would like to use custom Render Setting and Output Module templates in an Apple Qmaster cluster, copy this file to the same location on each node in the cluster. Then you can specify your templates when using the `-RStemplate` or `-OMtemplate` options.

The above example includes many additions to the shipping After Effects template. In order to render After Effects in a distributed environment, you must render an image sequence. User-specific sections must be edited every time. These include the comp name (`Comp 1`), output filename (`test[####].psd`), and possibly output module and render settings.

After Effects provides Render Setting and Output Module templates specifically for this environment. You can use custom After Effects render and output templates if you wish, but the output must be an image sequence. After Effects stores its custom template information in ~/Library/Preferences/Adobe After Effects 6.5 Prefs/. If you would like to use your custom Render Setting and Output Module templates in the cluster, copy this file to the same location on each node in the cluster. Then you can specify your templates when using the `-RStemplate` or `-OMtemplate` options.

Optionally, you can use Notification and Set Environment before you submit. Notification is email notification: Enter an email address and SMTP server, and you will be notified about the completion of your batch and its status. Use Set Environment to define variables on a per-batch basis. For more information, see Setting Environment Variables in Apple Qmaster.

Note: Apple Qmaster does not currently support SMTP servers that require authentication.

Using Apple Qmaster to Submit UNIX Commands

You can use Apple Qmaster for distributed processing of any UNIX commands, including any application that can be operated from the command line. Apple Qmaster provides a convenient way to issue commands, shortening the amount of typing you need to do by providing an interface for the global parts of the command.

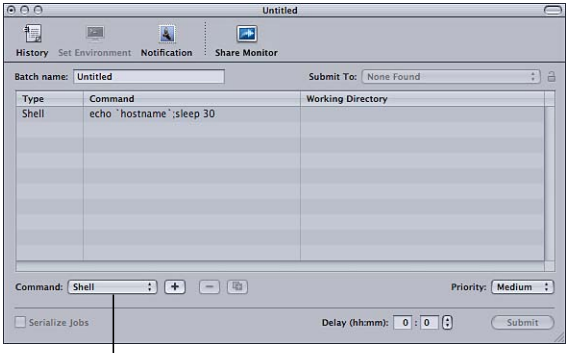
To distribute UNIX command batches with Apple Qmaster

1. Open Compressor and choose Apple Qmaster > Create Rendering Jobs.

   Apple Qmaster opens.

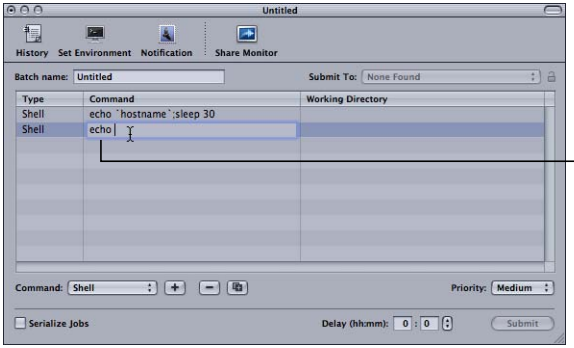
2. Enter a name for the batch in the "Batch name" field. (This is the name that appears in Share Monitor.)

3. Choose Shell from the Command pop-up menu.



4 For each job you want to add to the batch, click the Add (+) button, then type the UNIX command in the Command column.

The UNIX command might specify, for example, the application, an output destination, and a couple of command-line options.



Note: If you need to delete a job from this batch (before you submit the batch), select the job you want to delete and click the Remove (–) button.

5 As needed, set the following options for this batch.

- *Submit To:* Choose a cluster to process this batch.
- *Working Directory:* If relevant, enter the working directory (from which you want the command to be executed).
- *Priority:* Choose the priority level from the pop-up menu. The higher the priority, the sooner and faster this batch will be processed relative to other batches.
- *Delay:* Specify how long you would like the system to wait before processing this batch.

6 Click Submit to submit the batch for processing.

Using Nodes Without Apple Qmaster Installed

You can create a cluster containing one or more computers that do not have Compressor installed. To do this, you configure an intermediary service node that executes Apple Qmaster commands on other computers, called *extended nodes*. The intermediary service node runs UNIX Apple Qmaster commands on the extended nodes via the SSH (secure shell) UNIX program, so that the extended nodes can process Apple Qmaster batches without having Compressor installed. This type of cluster is called an *extended node cluster*.

Will Your Cluster Include Only Extended Nodes or Be Mixed?

If all the nodes in the cluster will be extended nodes (nodes that do not have Compressor installed), the cluster needs one intermediary node that also acts as the cluster controller. There is no need to use the Apple Qadministrator application at all if you are creating a cluster that contains only an intermediary node and extended nodes. All the configuration can be done in the Apple Qmaster Sharing window in Compressor, as described in Configuring an Intermediary Node for an Extended Node Cluster.

However, if you want a cluster that contains both regular service nodes and extended nodes, configure an intermediary node (as described in Configuring an Intermediary Node for an Extended Node Cluster), and then add it to a regular cluster that already has a cluster controller. (There can be only one cluster controller per cluster.)

Configuring an Intermediary Node for an Extended Node Cluster

Before you begin, make sure that:

- The computer that will be the intermediary service node has Compressor installed
- The computers that will be the extended nodes have a UNIX-based operating system and have SSH enabled

To configure an intermediary service node to run Apple Qmaster commands on extended nodes

1. Open the Apple Qmaster Sharing window in Compressor.
2. If this intermediary node will be part of a mixed cluster, with a different computer acting as the cluster controller, skip this step and go to step 3. If you want this intermediary node to be the cluster controller for this cluster, do the following:
   a. Select the "Share this computer" checkbox, then select one of the following buttons:
      - "as QuickCluster with services"
      - "as Services and cluster controller"

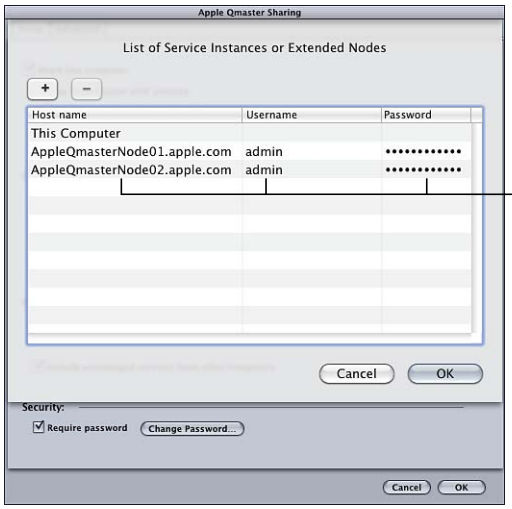
      For more information on creating cluster controllers, see the "Apple Qmaster and Distributed Processing" chapter in the *Compressor User Manual*.
   b. Enter a name in the "Identify this QuickCluster as" field. This is the name you will see in the Cluster list in Apple Qadministrator and in the cluster pop-up menus in Share Monitor and Apple Qmaster.

3. Select the Rendering and "Require these services to only be used in managed clusters" checkboxes.
4. Click the Options button next to the Rendering item.

5 In the dialog that appears, add an instance for each extended node you want this intermediary node to send commands to:

a Choose SSH from the Add (+) pop-up menu.

b Edit the Host name, Username, and (if applicable) Password columns so that they describe each computer you want to use as an extended node, then click OK.



6 In the Apple Qmaster Sharing window, click OK.

Note: If you are making changes to existing settings and this computer is already providing processing services, a dialog appears warning you that its services must be restarted for the changes to take effect. You are able to delay the restart by entering the number of minutes to wait, giving you time to warn others or for current batches to finish processing.

If you configured this intermediary node as the cluster controller, your work is done and the extended node cluster is ready to start receiving and processing batches submitted by Apple Qmaster.

If, instead, you want the extended nodes to be part of a cluster that includes regular service nodes, use Apple Qadministrator to add this intermediary node to that cluster. You add an intermediary node in the same way you add other service nodes, as described in the "Apple Qmaster and Distributed Processing" chapter in the *Compressor User Manual*, available in Compressor Help.

Setting Environment Variables in Apple Qmaster

You may want to set or change an environment variable for submitting certain jobs. When you set an environment variable within Apple Qmaster, the new setting takes effect immediately. This gives you an easy way to do things such as setting common directory paths or plug-in-specific environment variables for Apple Qmaster jobs.

About Environment Variables and Preflight Scripts

You can streamline your workflow with environment variables and preflight scripts.

What's an Environment Variable?

Environment variables are settings within a shell, from which commands are issued that affect the way a program operates. People who regularly execute commands from a Terminal shell, or write shell scripts, are usually familiar with environment variables.

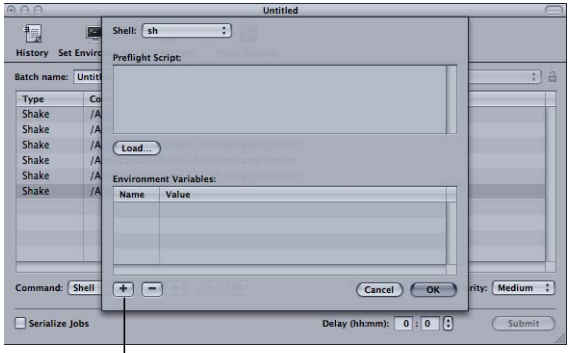
For example, the environment variable called PATH tells the shell where to look for commands that are entered. The PATH that is specified becomes the search path that is used when locating a program. It is set for you automatically, but you will want to add to it. For instance, if your user name is jane and there is a directory named groupbin (in your home directory) that contains programs you want to run from a shell, the environment variable name would be PATH and the value of that name would be ~jane/groupbin.

What's a Preflight Script?

A *preflight script* is a script you can run on each node of a cluster prior to actually processing the batch. These scripts are sent with every distributed segment of a job.

To set environment variables in Apple Qmaster

1. Select the command for which you want to set an environment variable.
2. Click the Set Environment button.
3. In the dialog that appears, you can add preflight scripts and environment variables or edit or remove an existing one.



Click the Add (+) button, then enter a variable name and value.

- *To add a variable:* Click the Add (+) button, then select and edit Untitled Variable in both the Name and Value columns.
- *To remove a variable:* Select it, then click the Remove (–) button.

4 Click OK.

Your environment variables take effect immediately, and are retained only for the selected command.